

JudoLive (Raspberry Pi)

JudoLive connects to a JudoTimer and receives information about the current competitors, clocks, and scores. It overlays the information on a live video stream. Example:



Video can be streamed for example to YouTube. You can use a Raspberry Pi camera module or a USB camera or both.

Installation

Install Raspberry Pi software as usual (<https://www.raspberrypi.org/software/>).

Install gdebi, that is used for local deb package installation:

```
sudo apt install gdebi
```

Copy/download `judolive_x.x-1_armhf.deb` to the Raspberry Pi. Install JudoLive:

```
sudo gdebi judolive_x.x-1_armhf.deb
```

You will be asked

```
SRS is an RTMP server that can be used for testing purposes.
```

```
Do you want it to be started automatically as a service? (yes/no)
```

A simple RTMP server program will be installed as a service if you answer yes. It might be handy to start experiments with.

Next installation asks

You can start Judolive manually by using the command 'judolive'.

Do you want it to be started automatically as a service? (yes/no)

Answer yes if you want JudoLive to start automatically after a reboot. If you do not want that, you can start JudoLive manually:

```
judolive
```

This way you can see debug printings.

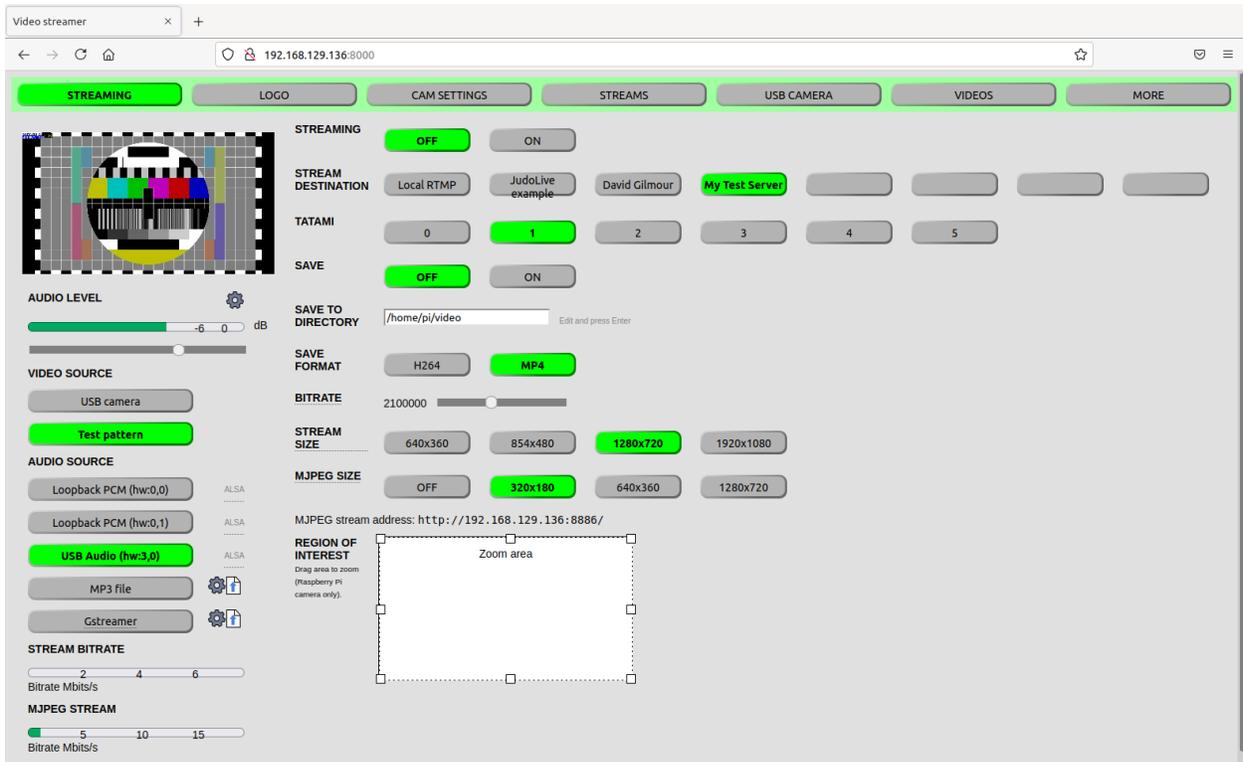
Summary:

| Command | Explanation |
|---|---|
| judolive | Start JudoLive manually. |
| sudo systemctl start judolive.service | Run JudoLive as a service. |
| sudo systemctl stop judolive.service | Stop JudoLive. |
| sudo systemctl enable judolive.service | Start JudoLive automatically after a reboot. |
| sudo systemctl disable judolive.service | Do not start JudoLive automatically. |
| sudo systemctl status judolive.service | Check if JudoLive is running ok. |
| | Use the same systemctl commands for SRS RTMP service. Only replace judolive with srs. |

Usage

JudoLive is controlled by a web browser. Find your Raspberry's IP address. Then connect to port 8000. Thus, URL will be like <http://192.168.200.123:8000/>

You will see the following page:

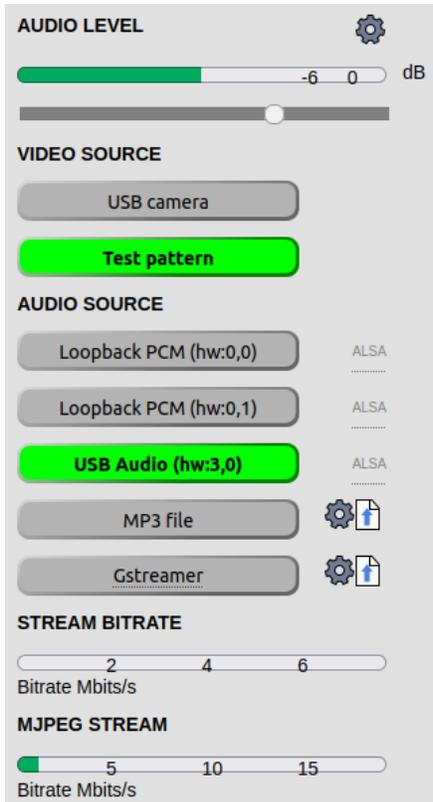


Main page selections are:

- STREAMING: Stream specific settings.
- LOGO: Overlay logos and texts control.
- CAM SETTINGS: Settings for Raspberry Pi camera module.
- STREAMS: Streams URL configuration.
- USB CAMERA: Settings for USB camera, if connected.
- VIDEOS: Control for saved video processing.
- MORE: Miscellaneous settings and controls.

Common controls

There are a few controls and settings that are visible on all the pages.



Audio level

An indicator shows audio level. Keep it in the green area. Use a slider to set the volume level. Click the settings icon (wheel) to open an audio mixer.

Video source

The default video source is Raspberry Pi camera module if installed. Click the *USB camera* to select it or *Test pattern* if you do not want to stream a live picture.

Audio source

Audio source is most probably a USB microphone or mic of the camera. Those are called ALSA devices. Loopback devices and Gstreamer are for advanced users.

Click the sheet icon to upload MP3 files. Click the settings icon to select a file. Click *MP3 file* to start playback.

Stream bitrate

Indicator for the current stream bitrate (Mbits/s).

MJPEG stream

Bitrate of the MJPEG stream that is shown locally in the window top left.

STREAMING

Streaming

Select *on* or *off*. Everything else works even if the selection is *off*, like saving to the file.

Stream destination

Select one of the streams defined on the STREAMS page.

Tatami

JudoTimer to connect to. JudoLive listens to JudoTimers' advertising messages. SSDP protocol uses multicast packages that should work in all networks.

Save

Save video to a file.

Save to directory

A directory to save the videos. Videos are named automatically using a tatami number and a time stamp.

Save format

Use only MP4. H264 has no audio or time stamps.

Bitrate

Slider to set the bitrate. Check from YouTube instructions what is a good one. For 1280x720 picture resolution 2 - 3 Mbits/s is a good starting point.

Stream size

Resolution of the stream picture. 1280x720 works quite well.

MJPEG size.

Resolution of the local MJPEG stream. Use the lowest value. MJPEG is generated by software and uses pretty much CPU power.

Region of interest

This works with the Raspberry Pi camera module only. Select the area to zoom the picture to.

LOGO

You can overlay the video stream with graphics and texts. Find this and click the upload icon:

Available logos and texts 

Uploaded logos will appear on the right. Drag and drop logos to the display area. To add texts fill in the edit boxes at the bottom. Example has one logo and one text saying that competition will start at 10 o'clock. Text is white, and the background is red.

| Show | Text | Color | Background | X | Y |
|---------------------------------------|----------------------------------|-------|------------|------|-----|
| 1 <input checked="" type="checkbox"/> | @ijf.png | Black | Black | 1016 | 42 |
| 2 <input checked="" type="checkbox"/> | Competition will start at 10:00. | White | Red | 444 | 296 |
| 3 <input type="checkbox"/> | Lunch break | Black | Black | 0 | 0 |
| 4 <input type="checkbox"/> | | Black | Black | 0 | 0 |
| 5 <input type="checkbox"/> | | Black | Black | 0 | 0 |
| 6 <input type="checkbox"/> | | Black | Black | 0 | 0 |

Submit changes

There is another text “Lunch break” that can be activated by clicking the checkbox or by dragging it from the right. If text starts with ‘@’ it is the name of a logo file. X and Y determine coordinates of the logo or text. 0, 0 is at the top left.

Note that overlaying a wide area takes more CPU power.

Cam settings

Settings for Raspberry Pi camera module. These are standard settings that are not explained here any further.

Streams

Page to define video stream target(s). Table consists of three columns:

- Name: Select a meaningful name.

- Destination: URL of the server. They start with rtmp://, YouTube URLs start rtmp://a.rtmp.youtube.com/live2/.... You should never show these to anyone, thus texts are hidden. You can see them by writing a password and pressing Enter. By default, there is no password set. A password can be set on page MORE.
- Watch link: An optional link to watch the stream. If set you can click the link *Watch* on the right and a default browser should open.

USB Camera

USB camera is shown here. Available settings and modes depend on the camera. It is highly recommended using a camera that can provide a H264 stream. It can be decoded in Raspberry Pi by hardware, and thus it doesn't load the CPU.

Videos

After the competition you will have files in `/home/pi/video` or whatever was your choice. File name starts with a tatami number followed by a timestamp. There are three types of files:

- mp4: MP4 file containing the video.
- moov: Backup information about the stream. A MP4 file may be corrupted for example if there was a reboot. Moov files can be used to fix the MP4 file.
- txt: Text file contains information about the matches.

You may want to excerpt individual matches from the long files. In this example you have two files:

SAVED VIDEOS

Title: Publish destination:

Description: Split directory:

| File | Split |
|--|--|
| <input type="text" value="1-20201003_173614.mp4"/> | 0 <input type="button" value="Split"/> |
| <input type="text" value="2-20201003_114952.mp4"/> | 0 <input type="button" value="Split"/> |

Title and *Description* are for YouTube. *Split directory* is a working directory. *Publish destination* is not yet used. *Terminal* gives you a window where you can follow the process.

Excerpt the matches by clicking the *Split* buttons next to the file names (original long files are not touched). Match list will appear on the right side:

SAVED VIDEOS

Title: Publish destination: Edit and press Enter

Description: Split directory:

| File | Split | Cat | White | Blue | Start | Duration | | |
|--|---|------|------------|-----------------|---------|----------|-----------------------|--|
| <input type="text" value="1-20201003_173614.mp4"/> | 6 <input type="button" value="Split"/> | M-81 | SALA | PAUKKU | 0:03:57 | 2:19 | Watch | <input type="button" value="Publish"/> |
| <input type="text" value="2-20201003_114952.mp4"/> | 11 <input type="button" value="Split"/> | M-81 | IHANAMÄKI | MÄKINEN | 0:06:16 | 7:00 | Watch | <input type="button" value="Publish"/> |
| | | M-81 | LAAKKONEN | TERVONEN | 0:13:16 | 3:29 | Watch | <input type="button" value="Publish"/> |
| | | M-73 | VILLANELLO | KHIRCHILASHVILI | 0:16:45 | 2:15 | Watch | <input type="button" value="Publish"/> |
| | | M-73 | PAJUNEN | AZIZ | 0:19:00 | 1:31 | Watch | <input type="button" value="Publish"/> |
| | | M-73 | KORHONEN | DJOUKAEV | 0:20:31 | 2:59 | Watch | <input type="button" value="Publish"/> |
| | | M-73 | OLIN | TVAURI | 0:23:30 | 8:05 | Watch | <input type="button" value="Publish"/> |
| | | M-81 | MÄKINEN | SALA | 0:31:35 | 2:03 | Watch | <input type="button" value="Publish"/> |
| | | M-81 | LAAKKONEN | HEINONEN | 0:33:38 | 7:29 | Watch | <input type="button" value="Publish"/> |
| | | M-73 | AHONEN | VILLANELLO | 0:41:07 | 6:35 | Watch | <input type="button" value="Publish"/> |
| | | M-73 | RÖNTY | PAJUNEN | 0:47:42 | 13:55 | Watch | <input type="button" value="Publish"/> |

First file contains 6 matches and the second one 11 matches. Click *Watch* if you want to check the result.

Publishing

First a warning: Don't let music in your streams. YouTube detects even a few seconds sample and sends you a warning. In the worst case your stream will be stopped. I have contacted our local authorities, and they say that there are agreements which give me legal rights to use whatever music I like. YouTube doesn't care about those.

I have used the YouTube API for publishing. It used to work fine. Then there was a restriction that 50 videos per day was the maximum. Not a big problem. Upload took a few days. Then, somehow, my credentials didn't work anymore. I had new ones, and since I was a "new" user, my restriction was 4 videos per day!

As a workaround I made a web robot that used the web interface for uploading. It worked fine, except YouTube keeps on changing their web constantly. Also, I perhaps overused it and got banned.

Any hints for publishing are welcome. Meanwhile, publishing doesn't work. You have to do it manually.

More

Miscellaneous settings and indications.

JudoTimer connection

Indicates whether the connection is working.

CPU load

Indicates CPU load of Raspberry Pi. This is not very accurate, it is better to use terminal command "top" instead.

Focus lens

If Raspberry Pi has a TFT display this will show part of the camera picture pixel by pixel for accurate manual focus.

Screen saver

If Raspberry Pi has a TFT display it will be put blank after a timeout. 0 means no screen saver.

Restart camera

Restart the JudoLive program. May be needed after some settings or environment changes.

Halt system

Halt Raspberry Pi for power off.

Set password

Type in the old password (by default none) and set a new password.

TFT event

If Raspberry Pi has a TFT display you can control JudoLive by tapping it. Swap X and/or Y axis if the display is not correct.